

REMARKS

Claims 1-36 are presently pending in the application. Applicants amend claims 1, 5, 7, 20, 25 and 34, and add new claim 36. Support for the amendments and the new claim can be found on pages 2-6, 91-99, in the original claims and throughout the remainder of the specification. No new matter is added. The application is believed to be in condition for allowance. Hence, reconsideration and allowance are respectfully requested.

Information Disclosure Statement

In response to the Examiner's indication that a previously filed information disclosure statement failed to comply with 37 CFR 1.98(a)(2), Applicants file another information disclosure statement, together with this Response, that incorporates a legible copy of each cited reference.

Notwithstanding, if the Examiner still finds some references not sufficiently legible, Applicant respectfully request that the Examiner identify such references so that they can be resubmitted.

Rejections Under 35 U.S.C. 112

In response to the rejection of claim 21 because it is unclear whether the phrase "the central switch fabric subsystem," recited at line 6 of this claim, refers to the first or the second central switch fabric subsystem, this claim is amended to change this phrase to "the second central switch fabric subsystem."

This amendment is believed to overcome the 112 rejections of this claim and claims 22-24, which depend either directly or indirectly on claim 21.

Rejections Under 35 USC 102

The Office Action rejects claims 1, 7, 11-13, 16 and 20 as being anticipated by U.S. Patent No. 5,105,420 of Ardon.

Claim 1, as amended, recites a network device that includes a central switch fabric subsystem and a distributed switch fabric subsystem coupled to the central switch fabric

subsystem. The distributed subsystem is capable of transferring network data *packets* with the central switch fabric subsystem.

Ardon describes an architecture for a central office wire center having a switching system and a digital access and crossconnect system (DACS) under the common control of an administrative module. The switching system includes a plurality of distributed switch units and a central switch that provides connection between different ones of the distributed switch units. An interconnection arrangement of the switching system selectively connects peripheral interface units, which can consist of lines and trunks, to the distributed switch unit that in turn processes calls received through the interface units.

The switching system of Ardon is understood to provide traditional switching of calls received through a plurality of lines, and not routing of *packetized* data, as recited in claim 1. In other words, Ardon does not teach a distributed switching subsystem that in conjunction with a central switch fabric allows routing packetized data on a packet-by-packet basis. The routing of packetized data is fundamentally distinct from traditional call switching in that it requires parsing the routing information encapsulated in each packet for transmission of that packet.

Accordingly, claim 1 and claims 7, 11-13, and 16, which depend either directly or indirectly on claim 1, distinguish patentably over Ardon.

Claim 20, as amended, recites a network device having a central switch fabric subsystem and a plurality of distributed switch fabric subsystems that are coupled to the central switch fabric subsystem. A distributed switch fabric subsystem is capable of transferring network data with each distributed switch fabric subsystem through the central switch fabric subsystem. Further, at least one of the distributed switch fabric subsystems comprises a distributed data transfer subsystem comprising a *distributed data transfer subsystem having a data slice component*, and a distributed controller subsystem coupled with the distributed data transfer system for controlling network data transfer through the distributed data transfer subsystem.

As noted above, Ardon does not describe its distributed switch units as being capable of transferring network *packet* data with one another via the central switch. Moreover, Ardon's

distributed switch units do not include the *data slice component* recited in claim 20, and hence do not provide the functionality afforded by such a data slice component. For example, a data slice component of a distributed switch fabric subsystem can not only route data segments to other components (e.g., a cross-bar switch that in turn sends the data to another distributed switch fabric subsystem) but it can also include a buffer for holding low priority data while transmitting higher priority data.

Thus, amended claim 20 distinguishes patentably over Ardon.

Rejections Under 35 USC 103

The Office Action rejects claims 2-6 and 25-33 as being unpatentable over Ardon in view of U.S. Patent No. 5,740,171 of Mazzola.

Claim 2 depends on amended claim 1 and hence incorporates its features. In addition, claim 2 recites that the distributed switch fabric subsystem is located on a line card.

As discussed above, Ardon does not describe its distributed switch units as being capable of switching packetized network data. Mazzola fails to cure the shortcomings of Ardon in this regard in that it does not teach a central switch fabric subsystem and a distributed switch fabric subsystem coupled to the central switch fabric subsystem for transferring network data *packets* therewith. Rather, Mazzola is directed to an address translation mechanism for rendering forwarding decisions for data frames transported among ports of a switch based on, e.g., virtual local area network associations among the ports.

Similar arguments apply to establish that the combined teachings of Ardon and Mazzola fail to teach or suggest the subject matter of claims 3 and 4.

Claim 5 is rewritten as an independent claim to recite a network device having a central switch fabric subsystem and a *distributed switch fabric subsystem* that is coupled to the central switch fabric subsystem and is capable of transferring network data with the central switch fabric subsystem. Further, the central switch fabric subsystem includes a *controller* subsystem that is located on a *first switch fabric card* and a central data transfer subsystem that is coupled with the

controller subsystem. A portion of the central *data transfer subsystem* is located on a *second switch fabric card*. Such distribution of the data transfer capability of the central switch fabric system among different cards can provide certain advantages. For example, it can reduce the cost of minimally configuring a network device while providing the option of enhancing the device's capability. *See, e.g., page 2 of the specification.*

Ardon does not teach or suggest a central switch fabric subsystem such as that recited in claim 5. In particular, there is no indication in Ardon that its central switch includes a controller subsystem located on one card and a central data transfer subsystem, a portion of which is located on a separate card. Further, although Mazzola broadly states that a switch is a computer that can have a collection of cards interconnected by a backplane of wires, it does not teach or suggest a central switch fabric subsystem coupled to a plurality of distributed switch fabric subsystems, much less locating a controller subsystem of the central switch fabric subsystem on one card and a portion of the data transfer subsystem of the central switch on a separate card.

Hence, Ardon does not teach all of the features of claim 5, and their concomitant advantages. Claim 6 depends on claim 5, and further recites that the central data transfer subsystem is located on a *third switch fabric card* – a feature not taught by Ardon or Mazzola. Hence, claims 5 and 6 are patentable as well.

Claim 25, as amended, recites a network device having a plurality of switch fabric cards comprising a central switch fabric subsystem and a *plurality of forwarding cards* coupled with the switch fabric cards. Each forwarding card comprises a switch fabric interface and a distributed switch fabric subsystem. Further, each forwarding card is capable of transmitting network *packet* data to another forwarding card through its switch fabric interface and via the central and the distributed switch fabric subsystems.

The forwarding cards recited in claim 25 are distinct from the distributed switch units described in Ardon, as each forwarding card is capable of transmitting *packetized* data to the other forwarding cards. Further, as discussed above, Mazzola fails to teach or suggest the central and the distributed switch fabric subsystems recited in claim 25. The Examiner states that the line cards of a switch system can be broadly interpreted as forwarding cards “since each line

card forwards information out the card.” In response, Applicants note the forwarding cards recited in claim 25 are described as having specific structure and functionality, not taught by either Ardon or Mazzola. In particular, each forwarding card comprises a *switch fabric interface* and a *distributed switch fabric subsystem*. In addition, each forwarding card can transmit packetized data to another forwarding card by employing its switch fabric interface and distributed switch fabric subsystem. Hence, each forwarding card has specific structural features that characterize the manner by which it forwards information – features not provided in a generic line card.

Thus, amended claim 25, and claims 26-33 that depend on claim 25, distinguish over the cited art.

Claim 33, as amended, recites a network device that includes a plurality of switch fabric cards comprising a central switch fabric subsystem and at least one local timing subsystem and a forwarding card that is coupled with the switch fabric cards. The *forwarding card* includes a *switch fabric interface* and a *data slice subsystem* that is coupled with the switch fabric interface and with at least a portion of the switch fabric cards for transferring network data with the central switch fabric subsystem. The forwarding card further includes a *data slice controller* that is coupled with the data slice subsystem and at least a portion of the switch fabric cards for controlling network data transfer by the data slice subsystem, and a local timing subsystem that is coupled with the data slice subsystem and the data slice controller. The network device further includes a central timing subsystem coupled with the at least one local timing subsystem within the central switch fabric subsystem and with the local timing subsystem on the forwarding card.

The Examiner states that Ardon discloses, at col. 11, lines 41-47, the use of time slots which necessitate a “data slice subsystem.” Applicant respectfully disagree for the following reasons. This passage of Ardon states that when the central control determines that a reconfiguration of connections between peripheral interface units and the distributed switch units is desirable, it instructs an interconnection arrangement subsystem to perform the reconfiguration. Ardon indicates such a reconfiguration may be carried out to affect load balancing between the distributed control units or to affect switching element resources, e.g.,

time slots. This passage of Ardon does not even remotely suggest that each distributed switch unit has a data slice subsystem and a data slice controller as recited in claim 33. The reference to time slot in the cited passage simply refers to one parameter regarding switch resources that can be utilized by the central control to determine whether a reconfiguration of connections is desired, and not to a data slice subsystem present in each distributed switch to control transfer of data from that switch to the central switch. Nor does Mazzola teach or suggest such data slice components employed in a distributed switch fabric system in a network device.

In Paragraph 30, the Office Action rejects claims 8-10, 14, 15, 18 and 19 as being obvious over Ardon.

These claims depend either directly or indirectly on claim 1, and hence incorporate its patentable features that, as discussed above, are not taught by Ardon. Further, these claims recite additional elements. For example, claim 9 recites that the distributed data transfer subsystem comprises a data slice component – a feature not taught by Ardon. Hence, similar to claim 1, these claims are also patentable over Ardon.

In Paragraph 38, the Office Action rejects claim 17 as being unpatentable over Ardon in view of U.S. Patent No. 6,246,692 of Dai.

Claim 17 depends indirectly on claim 1 (via claim 12) and further recites that the central data transfer system comprises a cross-bar component.

As noted above, Ardon fails to teach a central switch fabric subsystem coupled to a distributed switch fabric subsystem suitable for switching *packetized* data. Dai fails to bridge the gap in the teachings of Ardon as it too fails to teach or suggest such a distributed switching system in a network device.

In Paragraph 40, the Office Action rejects claims 21-24, 34 and 35 as being obvious over Ardon in view of U.S. Patent No. 6,411,599 of Blanc.

Claims 21-24 depend either directly or indirectly on claim 20, and hence incorporate its features. As discussed above, Ardon fails to teach the salient features of claim 20. Further, Blanc fails to teach a central switch fabric subsystem coupled to a plurality of distributed switch fabric subsystems.

Similar arguments apply with equal force to establish that claims 34 and 35 are also patentable over the cite art.

New Claim 36

New claim 36 recites a network device having at least one port for data ingress and at least one port for data egress, and two forwarding subsystems, each of which is in communication with one of the ports. The device further includes a central switch fabric coupled to the forwarding subsystems for transferring *packetized* data therebetween, and a distributed switch fabric subsystem coupled to the central switch fabric and to at least one of the forwarding subsystem for transferring data therebetween.


The arguments presented above apply to establish that claim 36 distinguishes patentably over the cited art.

Conclusion

In view of the above amendments and remarks, Applicant respectfully request reconsideration and allowance of the application. If there are any remaining issues, the Examiner is invited to contact the undersigned at 617-439-2514.

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Respectfully submitted,

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